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EXAMINER	
KENNEDY, ADRIAN L	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No. 10/709,970	Applicant(s) MISHRA, AMULYA
	Examiner Adrian L. Kennedy	**Art Unit** 2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 August 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 June 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

Examiner's Detailed Office Action

1. This Office Action is responsive to Request For Continued Examination in application **10/709,970** filed **August 14, 2007**.

2. **Claims 1, 8, 13, and 17** were amended.

3. **Claim 21** was added.

4. **Claims 1-21** will be examined.

Claim Objections

5. Claims 1 and 17 are objected to because of the following informalities: Claim 1 is objected to for the use of the words "Proposed Amendment" in line 1, and claim 17 is objected to for the use of the words "Previously Presented" in line 1. The examiner asserts that the proper words in the claims 1 and 17 should be "Currently Amended". Furthermore, in order to further prosecution the examiner has examined claims 1 and 17 as if it said "Currently Amended". Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-6, 8-11, 13-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guiver et al. (USPN 5,809,490).

Regarding claims 1:

Guiver et al. teaches,

(Proposed Amendment): A method of reducing number of computations (Column 2, Line 34-37; "*the present invention effectively filters out data in portion of the data space with a heavy distribution of data or examples in favor of those with fewer data or examples*"; The examiner takes the position that by reducing the amount of data to be processed, Guiver et al. reduces the number of process) when modeling several systems (C 4, L 3-9; "*the techniques and processes according to the present invention can be utilized in a wide range of technological arts, such as speech recognition, image recognition, financial modeling, target marketing, and various process control application in oil refineries, chemical plants, power plants and industrial manufacturing plants, among others*") using a neural network, wherein said neural network contains a plurality of neurons (C 7, L 19-21; "*neurons*"), wherein each system is modeled by starting with a corresponding plurality of initial weights for said plurality of neurons (C 7, L 51-54; "*initial weight of the SOM network*") and performing computations iteratively to re-compute weights of at least one of said neurons until a pre-specified condition is obtained, wherein the weights of said neurons when said pre-specified condition is obtained represents final weights modeling the system (The examiner takes the position that the applicant's claimed iterative computations would have been obvious in light of

the iterative computation of weights until a predetermined threshold is reached in Column 9, Lines 54-58, Guiver et al. Additionally, the examiner takes the position that the re-computing of weights is analogous to the process of training the applicant's neural network, and would have been obvious to one skilled in the art in light of the training process taught by Guiver et al. See Response to Arguments below.), said method comprising:

receiving a first data set (C 4, L 43-44; "*the data selection apparatus acquires input data*") characterizing the behavior of a first system (C 3, L 41-46; "*the data collected varies according to the type of product being produced. For illustrative purposes, FIG. 1 shows the architecture of the computer supporting various process control data collection device such as various sensors and output driver in a representative plant*"), said first data set containing a first plurality of data elements (C 3, L 47-50; "*the representative plant is a refinery or chemical processing plant having a number of process variables such as temperature and flow rate variables*");

modeling said first system based on said first data set using said neural network, wherein a first set of weights are generated by said modeling said first system (C 7, L 6-11; "*each lattice cell is represented by a neuron associated with a P dimensional adaptable weight vector. The match between each weight factor is computed with every input. The best matching weight factor and some of its topological neighbors are then adjusted to better match the input points*"; The examiner takes the position that the generation of weights as taught in applicant's

claimed invention would have been obvious in light of the creation of a weight vector and the adjusting of weight factors taught in the invention of Guiver et al.), wherein said first set of weights corresponds to the set of final weights associated with said plurality of neurons modeling said first system (The examiner takes the position that the applicant's teaching of using final weights as the first set of weights would have been obvious in light of Guiver et al. teaching the use of the weight of his winning neuron from the previous iteration as the value used to set surrounding neurons in a succeeding iterations in Column 7, Lines 35-39);

receiving a second data set characterizing the behavior of a second system sought to be modeled by said neural network, said second data set containing a second plurality of data elements (The examiner takes the position that the "second data", and that the "second system" is analogous to the data input into the neural network and the system to be modeled after the initial training of the neural network using the training set (i.e. first data) and the training model (i.e. first system).)

determining whether said first plurality of data elements follow a similar pattern as said second plurality of data elements (C 9, L 64-66; "*the Kohonen neuron with the smallest distance adjusts its weight to be closer to the values of the input data*"; The examiner takes the position that determining of the distance between the weights and the input data is the method Guiver et al. uses to determine whether first and second data elements follow the same pattern); and

modeling said second system based on said second data set using said neural network, wherein said first set of weights are used as weights for said plurality of neurons while modeling said second system if said first plurality of data elements follow a similar pattern as said second plurality of data elements (C 9, L 64-66; "*the Kohonen neuron with the smallest distance adjusts its weight to be closer to the values of the input data. The neighbors of the winning neuron also adjust their weights to be closer to the same input data vector*").

Regarding claims 2:

Guiver et al. teaches,

(Previously Presented): The method further comprising storing said first set of weights in a non-volatile storage (C 4, L 17-20; "*one or more hard disk drives, preferably a CD-Rom player 117 and a disk drive*").

Regarding claims 3:

Guiver et al teaches,

(Previously Presented): The method wherein random values are used as said plurality of initial weights (C 7, L 50-52; "*the initial weights of the SOM network may be chose using a number of strategies. Preferably, the initial weights are selected using a random number generator*") for said plurality of neurons while modeling said second system if said first plurality of data elements do not follow a similar pattern as said second plurality of data elements (C 9, L 64-66; "*the Kohonen neuron with the smallest distance adjusts*

its weight to be closer to the values of the input data. The neighbors of the winning neuron also adjust their weights to be closer to the same input data vector").

Regarding claims 4:

Guiver et al. teaches,

(Original): The method wherein said determining comprises:

fitting said first data set into a first curve, wherein said first curve (C 2, L 30-34; "*input space of interest*") is represented in the form of a first polynomial function having a first set of coefficients (C 6, L 2-4; "*the model to be developed using this working set may be any data-driven form of model: linear, neural, polynomial, rational polynomial*"; The examiner takes the position that the use of functions as taught in applicants claimed invention is obvious in light of Guiver et al. teaching the use polynomials. Additionally, the examiner takes the position that coefficients are an inherent part of polynomials.);

fitting said second data set into a second curve (C 4, L 50-53; "*output space*"), wherein said second curve is represented in the form of a second polynomial function having a second set of coefficients (C 6, L 2-4; "*the model to be developed using this working set may be any data-driven form of model: linear, neural, polynomial, rational polynomial*");

computing a distance between said first set of coefficients and said second set of coefficients (The examiner takes the position that coefficients are equivalent to the weights taught in the invention of Guiver et al. This position is based on

applicant's specification which teaches in Paragraph 0047 that "[the] distance [the] each point from a corresponding point on the line/curve may be computed as [the] difference between the observed and predicted results". The process of calculating distance between observed result and predicted result using coefficients would have been obvious in light of the process of calculating the distance between input data and output data using weight as taught by Guiver in Column 9, Line 64 – Column 10, Line 32); and

checking (C 7, L 8-9; "*the match between each weight factor is computed*") whether said distance is less than a threshold (C 10, L 28-30; "*minimum distance*"), wherein said first plurality of data elements are determined to follow a similar pattern as said second plurality of data elements if said distance is less than said threshold.

Regarding claims 5:

Guiver et al. teaches,

(Original): The method wherein each of said first plurality of data elements and said second plurality of data elements is normalized to a pre-specified range prior to said fitting (C 4, L 61-63; "*the routine normalizes the augmented data. Preferably, the variable are normalized so that they are mean zero, and have values between –1 and +1*").

Regarding claims 6:

Guiver et al. teaches,

(Original): The method wherein each of said first set of coefficients and said second set of coefficients is normalized to a pre-specified range (C 7, L 37-39; "*once the winning neuron is chosen, the weight of the winning neuron must be adjusted and all units within its neighborhood are also adjusted*"; C 10, L 27-30; "*the Kohonen neuron with the minimum distance is called the winner and has an output of 1.0, while other Kohonen neurons have an output of 0.0*") prior to said computing (The examiner takes the position that the adjusting of weights takes place prior to computing the distance between input data and output data when training the Kohonen SOM in the invention of Guiver et al. (C 9, L 64 - C 10, L 33)).

Regarding claims 8:

Guiver et al. teaches,

(Currently Amended): A computer readable medium (C 4, L 21-24; "*flash ROM*") carrying one or more sequences of instructions (C 4, L 21-24; "*flash ROM 122 which contains boot-up information for the computer system S*") causing a digital processing system (C 3, L 9-11; "*computer system S which provides the processing capability*") reduce number of computations (C 2, L 34-37; "*the present invention effectively filters out data in portion of the data space with a heavy distribution of data or examples in favor of those with fewer data or examples*") in a neural network (C 2, L 26-27; "*the clusterizer is a neural network such as a Kohonen self-organizing map (SOM)*") modeling (C 2, L 39-43; "*the present inventions results in models which perform better*

over the entire space") several data sets (C 2, L 45-47; "*the analyzer is subsequently trained with important sub-sets of the training data*"), wherein said neural network contains a plurality of neurons, wherein each system is characterized by a corresponding data set containing data elements (The examiner takes the position that the data input into the invention of Guiver et al. inherently contains "data elements".) and expected values (C 2, L 19-21; "*desired output data*"), and is modeled by starting with a corresponding plurality of initial weights for said plurality of neurons and iteratively computing weights of said neurons until said plurality of neurons with associated set of final weights (The examiner takes the position that the applicant's claimed iterative computations would have been obvious in light of the iterative computation of weights until a predetermined threshold is reached in Column 9, Lines 54-58, Guiver et al. Additionally, the examiner takes the position that the re-computing of weights is analogous to the process of training the applicant's neural network, and would have been obvious to one skilled in the art in light of the training process taught by Guiver et al. See Response to Arguments below.) causes said neural network to provide output values within a desired degree of accuracy compared to expected output values (The examiner takes the position that the applicant's claiming of using weights to cause a neural network to provide an output within a desired accuracy level would have been obvious to one skilled in the art, in light of Guiver et al. teaching the use of a neural network in Column 2, Lines 26-27, the developing of outputs that minimize the error in Column 2, Lines 30-39, the use of output neurons in Column 7, Lines 27-28, and the use of neuron as weights in Column 7, Lines 35-39.), wherein execution of said one or more sequences of instructions by one or more processors

contained in said digital processing system causes said one or more processors to perform the actions of:

receiving a first data set (C 4, L 43-44; "*the data selection apparatus acquires input data*") and a first set of expected output values (C 2, L 19-21; "*desired output data*") characterizing the behavior of a first system (C 3, L 41-46; "*the data collected varies according to the type of product being produced. For illustrative purposes, FIG. 1 shows the architecture of the computer supporting various process control data collection device such as various sensors and output driver in a representative plant*"), said first data set containing a first plurality of data elements (C 3, L 47-50; "*the representative plant is a refinery or chemical processing plant having a number of process variables such as temperature and flow rate variables*");

modeling said first system based on said first data set using said neural network such that said neural network generates output values with a corresponding desired degree of accuracy compared to said first set of expected output values in response to receiving said first plurality of data elements (The examiner takes the position that the applicant's claiming of using weights to cause a neural network to provide an output within a desired accuracy level would have been obvious to one skilled in the art, in light of Guiver et al. teaching the use of a neural network in Column 2, Lines 26-27, the developing of outputs that minimize the error in Column 2, Lines 30-39, the use of output neurons in Column 7, Lines 27-28, and the use of neuron as weights in Column 7, Lines 35-39.), wherein a first set of

weights are generated by said modeling said first system (C 7, L 6-11; "*each lattice cell is represented by a neuron associated with a P dimensional adaptable weight vector. The match between each weight factor is computed with every input. The best matching weight factor and some of its topological neighbors are then adjusted to better match the input points*"; The examiner takes the position that the generation of weights as taught in applicant's claimed invention would have been obvious in light of the creation of a weight vector and the adjusting of weight factors taught in the invention of Guiver et al.), wherein said first set of weights corresponds to the set of final weights associated with said plurality of neurons modeling said first system (The examiner takes the position that the applicant's teaching of using final weights as the first set of weights is obvious in light of Guiver et al. teaching the use of the weight of his winning neuron from the previous iteration as the value used to set surrounding neurons in a succeeding iteration in Column 7, Lines 35-39);

receiving a second data set and a second set of expected output values characterizing the behavior of a second system sought to be modeled by said neural network, said second data set containing a second plurality of data elements (The examiner takes the position that the "second data", and that the "second system" is analogous to the data input into the neural network and the system to be modeled after the initial training of the neural network using the training set (i.e. first data) and the training model (i.e. first system).);

determining whether said first plurality of data elements follow a similar pattern as said second plurality of data elements (C 9, L 64-66; "*the Kohonen neuron with the smallest distance adjusts its weight to be closer to the values of the input data*"; The examiner takes the position that determining of the distance between the weights and the input data is the method Guiver et al. uses to determine whether first and second data elements follow the same pattern); and

modeling said second system based on said second data set and said second set of expected values using said neural network, wherein said first set of weights are used as weights for said plurality of neurons while modeling said second system if said first plurality of data elements follow a similar pattern as said second plurality of data elements (C 9, L 64-66; "*the Kohonen neuron with the smallest distance adjusts its weight to be closer to the values of the input data. The neighbors of the winning neuron also adjust their weights to be closer to the same input data vector*").

Regarding claims 9:

Guiver et al. teaches,

(Previously Presented): The computer readable medium further comprising storing said first set of weights in a non-volatile storage (C 4, L 17-20; "*one or more hard disk drives, preferably a CD-Rom player 117 and a disk drive*"; The examiner takes the position that the applicant's specific recitation of storing weights in said non-volatile storage would

have been obvious in light of Guiver et al. teaching the use non-volatile storage while not explicitly reciting the specifics of what is stored in said storage).

Regarding claims 10:

Guiver et al. teaches,

(Previously Presented): The computer readable medium wherein random values are used as said plurality of initial weights (C 7, L 50-52; "*the initial weights of the SOM network may be chose using a number of strategies. Preferably, the initial weights are selected using a random number generator*") for said plurality of neurons (C 7, L 19-21; "*neurons*") while modeling said second system if said first plurality of data elements do not follow a similar pattern as said second plurality of data elements (C 9, L 64-66; "*the Kohonen neuron with the smallest distance adjusts its weight to be closer to the values of the input data. The neighbors of the winning neuron also adjust their weights to be closer to the same input data vector*").

Regarding claims 11:

Guiver et al. teaches,

(Original): The computer readable medium wherein said determining comprises:

fitting said first data set into a first curve (C 2, L 30-34; "*input space of interest*"), wherein said first curve is represented in the form of a first polynomial function having a first set of coefficients (C 6, L 2-4; "*the model to be developed using this working set may be any data-driven form of model: linear, neural, polynomial,*

rational polynomial"; The examiner takes the position that coefficients are an inherent part of polynomials);

fitting said second data set into a second curve (C 4, L 50-53; "*output space*"), wherein said second curve is represented in the form of a second polynomial function having a second set of coefficients (C 6, L 2-4; "*the model to be developed using this working set may be any data-driven form of model: linear, neural, polynomial, rational polynomial*");

computing a distance between said first set of coefficients and said second set of coefficients (The examiner takes the position that coefficients are equivalent to the weights taught in the invention of Guiver et al. This position is based on applicant's specification which teaches in Paragraph 0047 that "[the] distance [the] each point from a corresponding point on the line/curve may be computed as [the] difference between the observed and predicted results". The process of calculating distance between observed result and predicted result using coefficients is obvious in light of the process of calculating the distance between input data and output data using weight as taught by Guiver in Column 9, Line 64 – Column 10, Line 32); and

checking (C 7, L 8-9; "*the match between each weight factor is computed*") whether said distance is less than a threshold (C 10, L 28-30; "*minimum distance*"), wherein said first plurality of data elements are determined to follow a similar pattern as said second plurality of data elements if said distance is less than said threshold.

Regarding claims 13:

Guiver et al. teaches,

(Currently Amended): An apparatus in a digital processing system said apparatus reducing number of computations when modeling several systems using a neural network, wherein said neural network contains a plurality of neurons (The examiner takes the position that in teaching the iterative computation of weights until a predetermined threshold is reached in Column 9, Lines 54-58, Guiver et al. anticipates the applicant's claimed iterative computations.), wherein each system is characterized by a corresponding data set containing data elements (The examiner takes the position that the data input into the invention of Guiver et al. inherently contains "data elements".) and expected values (C 2, L 19-21; "*desired output data*"), and is modeled by starting with a corresponding plurality of initial weights for said plurality of neurons and performing computations iteratively computing weights of said neurons until said plurality of neurons with associated set of final weights causes said neural network to provide output values within a desired error level (The examiner takes the position that the applicant's claiming of using weights to cause a neural network to provide an output within a desired accuracy level would have been obvious to one skilled in the art, in light of Guiver et al. teaching the use of a neural network in Column 2, Lines 26-27, the developing of outputs that minimize the error in Column 2, Lines 30-39, the use of output neurons in Column 7, Lines 27-28, and the use of neuron as weights in Column 7, Lines 35-39.), said apparatus comprising:

means for receiving a first data set (C 4, L 43-44; "*the data selection apparatus acquires input data*") and a first set of expected output values (C 2, L 19-21; "*desired output data*") characterizing the behavior of a first system (C 3, L 41-46; "*the data collected varies according to the type of product being produced. For illustrative purposes, FIG. 1 shows the architecture of the computer supporting various process control data collection device such as various sensors and output driver in a representative plant*"), said first data set containing a first plurality of data elements (C 3, L 47-50; "*the representative plant is a refinery or chemical processing plant having a number of process variables such as temperature and flow rate variables*");

means for modeling said first system based on said first data set using said neural network such that said neural network generates output values with a corresponding desired degree of accuracy compared to said first set of expected output values in response to receiving said first plurality of data elements (The examiner takes the position that the applicant's claiming of using weights to cause a neural network to provide an output within a desired accuracy level would have been obvious to one skilled in the art, in light of Guiver et al. teaching the use of a neural network in Column 2, Lines 26-27, the developing of outputs that minimize the error in Column 2, Lines 30-39, the use of output neurons in Column 7, Lines 27-28, and the use of neuron as weights in Column 7, Lines 35-39.), wherein a first set of weights are generated by said modeling said first system (C 7, L 6-11; "*each lattice cell is represented by a neuron associated with*

a P dimensional adaptable weight vector. The match between each weight factor is computed with every input. The best matching weight factor and some of its topological neighbors are then adjusted to better match the input points"; The examiner takes the position that the generation of weights as taught in applicant's claimed invention would have been obvious in light of the creation of a weight vector and the adjusting of weight factors taught in the invention of Guiver et al.), wherein said first set of weights corresponds to the set of final weights associated with said plurality of neurons modeling said first system (The examiner takes the position that the "second data", and that the "second system" is analogous to the data input into the neural network and the system to be modeled after the initial training of the neural network using the training set (i.e. first data) and the training model (i.e. first system).);

means for receiving a second data set and a second set of expected output values characterizing the behavior of a second system sought to be modeled by said neural network, said second data set containing a second plurality of data elements (The examiner takes the position that the "second data", and that the "second system" is analogous to the data input into the neural network and the system to be modeled after the initial training of the neural network using the training set (i.e. first data) and the training model (i.e. first system).);

means for determining whether said first plurality of data elements follow a similar pattern as said second plurality of data elements (C 9, L 64-66; "*the Kohonen neuron with the smallest distance adjusts its weight to be closer to the*

values of the input data"; The examiner takes the position that determining of the distance between the weights and the input data is the method Guiver et al. uses to determine whether first and second data elements follow the same pattern); and means for modeling said second system based on said second data set and said second set of expected values using said neural network, wherein said first set of weights are used as weights for said plurality of neurons while modeling said second system if said first plurality of data elements follow a similar pattern as said second plurality of data elements (C 9, L 64-66; "*the Kohonen neuron with the smallest distance adjusts its weight to be closer to the values of the input data. The neighbors of the winning neuron also adjust their weights to be closer to the same input data vector*").

Regarding claims 14:

Guiver et al. teaches,

(Previously Presented): The apparatus further comprising means for storing said first set of weights in a non-volatile storage (C 4, L 17-20; "*one or more hard disk drives, preferably a CD-Rom player 117 and a disk drive*"; The examiner takes the position that by teaching the use of non-volatile storage while not explicitly reciting the specific teaching of what is stored in said storage, the applicant's claimings would have been obvious in light of Guiver et al.'s recitation of storing weights in said non-volatile storage, wherein said second set of weights are generated by modeling said second

system (C 7, L 50-52; "*the initial weights of the SOM network may be chose using a number of strategies*").

Regarding claims 15:

Guiver et al. teaches,

(Previously Presented): The apparatus wherein random values are used as said plurality of initial weights (C 7, L 50-52; "*the initial weights of the SOM network may be chose using a number of strategies. Preferably, the initial weights are selected using a random number generator*") for said plurality of neurons (C 7, L 19-21; "*neurons*") while modeling said second system if said first plurality of data elements do not follow a similar pattern as said second plurality of data elements (C 9, L 64-66; "*the Kohonen neuron with the smallest distance adjusts its weight to be closer to the values of the input data. The neighbors of the winning neuron also adjust their weights to be closer to the same input data vector*"; The examiner takes the position that the initial winning neuron weight is used in the following training process regardless of whether the inputs (first data elements) follow a similar pattern of the outputs (second data elements). This position is based on the fact that Guiver et al. teaches in Column 10, Lines 4-11 that the correct output doesn't have to be known in order to determine a winning weight).

Regarding claims 16:

Guiver et al. teaches,

(Original): The apparatus wherein said means for determining is operable to:

fit said first data set into a first curve (C 2, L 30-34; "*input space of interest*"), wherein said first curve is represented in the form of a first polynomial function having a first set of coefficients (C 6, L 2-4; "*the model to be developed using this working set may be any data-driven form of model: linear, neural, polynomial, rational polynomial*"; The examiner takes the position that the use of functions as taught in applicants claimed invention is obvious in light of Guiver et al. teaching the use polynomials. Additionally, the examiner takes the position that coefficients are an inherent part of polynomials.);

fit said second data set into a second curve (C 4, L 50-53; "*output space*"), wherein said second curve is represented in the form of a second polynomial function having a second set of coefficients (C 6, L 2-4; "*the model to be developed using this working set may be any data-driven form of model: linear, neural, polynomial, rational polynomial*");

compute a distance between said first set of coefficients and said second set of coefficients (The examiner takes the position that coefficients are equivalent to the weights taught in the invention of Guiver et al. This position is based on applicant's specification, which teaches in Paragraph 0047 that "[the] distance [the] each point from a corresponding point on the line/curve may be computed as [the] difference between the observed and predicted results". The process of calculating distance between observed result and predicted result using coefficients is anticipated by the process of calculating the distance between input

data and output data using weight as taught by Guiver in Column 9, Line 64 – Column 10, Line 32); and

check (C 7, L 8-9; "*the match between each weight factor is computed*") whether said distance is less than a threshold (C 10, L 28-30; "*minimum distance*"), wherein said first plurality of data elements are determined to follow a similar pattern as said second plurality of data elements if said distance is less than said threshold.

Regarding claims 17:

Guiver et al. teaches,

(Previously Presented): A method of reducing number of computations (C 2, L 34-37; "*the present invention effectively filters out data in portion of the data space with a heavy distribution of data or examples in favor of those with fewer data or examples*"; The examiner takes the position that by reducing the amount of data to be processed, Guiver et al. reduces the number of process) when modeling several systems using a neural network, said method comprising:

receiving a first data set (C 4, L 43-44; "*the data selection apparatus acquires input data*") and a first set of expected values (C 2, L 19-21; "*desired output data*") characterizing the behavior of a first system (C 3, L 41-46; "*the data collected varies according to the type of product being produced. For illustrative purposes, FIG. 1 shows the architecture of the computer supporting various process control data collection device such as various sensors and output driver*

in a representative plant"), said first data set containing a first plurality of data elements (C 3, L 47-50; "*the representative plant is a refinery or chemical processing plant having a number of process variables such as temperature and flow rate variables*");

modeling said first system based on said first data set using said neural network such that said neural network generates output values with a corresponding desired degree of accuracy compared to said first set of expected output values in response to receiving said first plurality of data elements (The examiner takes the position that the applicant's claiming of using weights to cause a neural network to provide an output within a desired accuracy level would have been obvious to one skilled in the art, in light of Guiver et al. teaching the use of a neural network in Column 2, Lines 26-27, the developing of outputs that minimize the error in Column 2, Lines 30-39, the use of output neurons in Column 7, Lines 27-28, and the use of neuron as weights in Column 7, Lines 35-39.), wherein a first set of weights are generated by said modeling said first system (C 7, L 6-11; "*each lattice cell is represented by a neuron associated with a P dimensional adaptable weight vector. The match between each weight factor is computed with every input. The best matching weight factor and some of its topological neighbors are then adjusted to better match the input points*"; The examiner takes the position that the generation of weights as taught in applicant's claimed invention would have been obvious in light of the creation of a weight vector and the adjusting of weight factors taught in the invention of Guiver et al.);

receiving a second data set and a second set of expected output values characterizing the behavior of a second system, said second data set containing a second plurality of data elements (The examiner takes the position that the "second data", and that the "second system" is analogous to the data input into the neural network and the system to be modeled after the initial training of the neural network using the training set (i.e. first data) and the training model (i.e. first system).);

determining whether said first plurality of data elements follow a similar pattern as said second plurality of data elements (C 9, L 64-66; "*the Kohonen neuron with the smallest distance adjusts its weight to be closer to the values of the input data*"; The examiner takes the position that determining of the distance between the weights and the input data is the method Guiver et al. uses to determine whether first and second data elements follow the same pattern); and

modeling said second system based on said second data set and said second set of expected values using said neural network, wherein said first set of weights are used as initial weights while modeling said second system if said first plurality of data elements follow a similar pattern as said second plurality of data elements, wherein random values are used as initial weights while modeling said second system if said first plurality of data elements do not follow a similar pattern as said second plurality of data elements (C 9, L 64-66; "*the Kohonen neuron with the smallest distance adjusts its weight to be closer to the values of the input data.*

The neighbors of the winning neuron also adjust their weights to be closer to the same input data vector").

Regarding claims 18:

Guiver et al. teaches,

(Previously Presented): The method wherein said first set of weights are used as initial weights for said plurality of neurons in said neural network while modeling said second system (The applicant's claimed teaching of using the first set of weights if the first data set and second data set are similar, and using random values for the weights if the first data set and second data set aren't similar is obvious in light of the teaching of the invention of Guiver et al. The examiner takes the position that this obviousness is found in Guiver et al. teaching the training of his SOM network on a particular data set x, in Column 7, Lines 49-54, where for each data set, the network's weight values are initialized to random values, and while the data remains the same, the network continue to optimize the weights and error value for that data.).

Regarding claims 19:

Guiver et al. teaches,

(Previously Presented): The computer readable medium wherein said first set of weights are used as initial weights for said plurality of neurons in said neural network while modeling said second system (The applicant's claimed teaching of using the first set of weights if the first data set and second data set are similar, and using random values for

the weights if the first data set and second data set aren't similar is obvious in light of the teaching of the invention of Guiver et al. The examiner takes the position that this obviousness is found in Guiver et al. teaching the training of his SOM network on a particular data set x, in Column 7, Lines 49-54, where for each data set, the network's weight values are initialized to random values, and while the data remains the same, the network continue to optimize the weights and error value for that data.).

Regarding claims 20:

Guiver et al. teaches,

(Previously Presented): The apparatus wherein said first set of weights are used as initial weights for said plurality of neurons in said neural network while modeling said second system (The applicant's claimed teaching of using the first set of weights if the first data set and second data set are similar, and using random values for the weights if the first data set and second data set aren't similar is obvious in light of the teaching of the invention of Guiver et al. The examiner takes the position that this obviousness is found in Guiver et al. teaching the training of his SOM network on a particular data set x, in Column 7, Lines 49-54, where for each data set, the network's weight values are initialized to random values, and while the data remains the same, the network continue to optimize the weights and error value for that data.).

Regarding claims 21:

Guiver et al. teaches,

(New): The method wherein said pre-specified condition is obtained when said plurality of neurons with associated set of final weights causes said neural network to provide output values within a desired error level (The examiner takes that the applicant's claimed "obtaining" of a specified condition upon producing outputs within a desired error level would have been obvious to one skilled in the art in light of Guiver et al. teaching the use of a neural network in Column 2, Lines 26-27, the developing of outputs that minimize the error in Column 2, Lines 30-39, the use of output neurons in Column 7, Lines 27-28, and the use of neuron as weights in Column 7, Lines 35-39.)).

8. Claims 7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guiver et al. (USPN 5,809,490) in view of Carney. (USPN 2004/0093315).

Regarding claim 7:

Guiver et al. teaches the method of claim 4, but fails to teach the first and second data sets comprising stock share prices or corresponding stocks.

However, Carney does teach,

The method wherein each of said first data set and said second data set comprises stock share prices or corresponding stocks (P 0051; "*if the user wishes to train a neural network that predicts movements in a particular stock price, then he may wish to input historical data that represents how this stock behaved in the past*").

It would have been obvious to one skilled in the art at the time of invention to combine the invention of Guiver et al. with the invention of Carney for the purposes of reducing the number of computations (*Guiver et al.*; "*a smaller data set significantly reduces the*

model building or analyzer construction process") and predicting a stock price (*Carney*; "*train a neural network the predicts movements in a particular stock price*").

Regarding claim 12:

Guiver et al. teaches the computer readable medium of claim 11, but fails to teach the first and second data sets comprising stock and share prices or corresponding stocks.

However, Carney does teach,

The computer readable medium wherein each of said first data set and said second data set comprises stock share prices or corresponding stocks (P 0051; "*if the user wishes to train a neural network that predicts movements in a particular stock price, then he may wish to input historical data that represents how this stock behaved in the past*").

It would have been obvious to one skilled in the art at the time of invention to combine the invention of Guiver et al. with the invention of Carney for the purposes of reducing the number of computations (*Guiver et al.*; "*a smaller data set significantly reduces the model building or analyzer construction process*") and predicting a stock price (*Carney*; "*train a neural network the predicts movements in a particular stock price*").

Response to Arguments

Applicant's arguments filed on August 14, 2007 have been fully considered but are found to be non-persuasive. The unpersuasive arguments made by the Applicant are stated below:

In reference to Applicant's argument:

> Guiver does not disclose or reasonably suggest the use of final weights modeling a first system in modeling the second system using a neural network.

Examiner's response:

The examiner has considered the applicant's above arguments and has found that while Guiver does not explicitly recite the applicant's claimed, disclosed, and argued "modeling [of] a first system [and] modeling a second system using [the final weights obtained from the modeling of said first system, in] a neural network". However, the examiner takes the position that it was widely known in the art at the time of the applicant's invention that when training and using a neural network, that the neural network produces a first set of weights when modeled on training data and that upon completion of said training, the final weights produced at the completion of the neural network training phase, are used as initial weights when modeling subsequent data. Based on these arguments, the examiner asserts that the applicant's claimed invention would have been obvious to one skilled in the art in light of the teachings of Guiver. Additionally, the fact that Guiver teaches a training process that produces final weights, is supported by the applicant's argument which specifically states:

> "The [Applicant's] claimed final weights are analogous to the weights when the routine of Guiver exits, as taught above." (Page 11 of 14; Lines 20-22)

Furthermore, based on the above assertions and arguments by the examiner, the examiner has found the applicant's arguments to be non-persuasive.

In reference to Applicant's argument:

> There is no disclosure or suggestion in Guiver that the weights at the time of exiting are used in modeling other input data using the neural network in Guiver.

Examiner's response:

The examiner has considered the applicant's above arguments and has found that the use of the final weights after they obtained is inherent in the invention of Guiver. This position is based on the applicant arguing that the "[Applicant's] claimed final weights are analogous to the weights when the routine of Guiver exits as taught [in Column 9, Lines 54-63]" (Page 11 of 14; Lines 20-22). The examiner has found further support that after producing the final weights, Guiver uses the final weights, in his teaching in Column 7, Lines 46-48, that "**prior to using the Kohonen SOM clusterizer, the SOM [is] trained**" (Emphasis Added) and that the final weights produced in Column 9, Lines 54-63, are part of said training process. Therefore, based on the applicant's arguments and the teaching of Guiver, the examiner has found the applicant's statement that the final weights produced in Guiver are used to model input data to be non-persuasive.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adrian L. Kennedy whose telephone number is (571) 270-1505. The examiner can normally be reached on Mon -Fri 8:30am-5pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on (571) 272-3687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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